

BULLETIN

OF

MISCELLANEOUS INFORMATION.

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CCCCXCI.—CULTIVATION OF VEGETABLES.

In the *Kew Bulletin* for July 1894 (pp. 219–223) an article was reprinted from the *Standard* on the importation of vegetables. This newspaper is ordinarily well-informed on agricultural subjects, and the article appeared to give a fair summary of facts which certainly deserved careful study. Kew is not occupied with vegetable growing, and the article was reprinted only with the object of drawing attention to the subject as an economic problem.

Two of the leading horticultural journals commented upon it. The *Gardeners' Magazine* for July 21st, 1894, wrote as follows:—

MARKET SUPPLIES OF VEGETABLES.

In the current issue of the *Kew Bulletin* is given a reprint of an article from one of the dailies on the market supplies of vegetables, and as it now appears with the official sanction of a great Government department, “as a useful and, doubtless, correct summary of the facts,” we feel compelled to take some notice of it. The writer states in his opening remarks that we receive large quantities of vegetables from various parts of the Continent, and that produce of excellent quality is to be met with on the costers’ stalls both in London and the provincial towns, and to these statements no exception can well be taken. We are also in agreement with the writer when he tells us that the prices of tomatoes and cauliflowers have fallen considerably during the past 12 years, as indeed we are upon some other points. But there is much to which exception must be taken. We are informed, for instance, that, “In September come to hand the excellent Belgian kidneys, in many respects the very best in the market,” and that, “as to the winter importation proper, tons upon tons become the property of English buyers, to whom they are consigned from the port of Hamburg.” If the Belgian kidney is the “very best” potato in the market during September, it is a matter for some surprise that it has no longer a place in the market reports of that month. Further, what is said with reference to “tons upon tons” of potatoes sent from Germany, and to the German redskin holding “a high place in the market, and even continues to do so until late into April,” might have held good from 10 to 20 years ago; but of late years the importation of German potatoes has greatly declined, as proved by the fact that in December 1893 we received 49 tons, and in the corresponding month of 1891 six tons only were imported from that country. “With regard to onions,” we are assured that “England appears to be wholly dependent

upon the stupendous foreign importations." If this be so, it would be interesting to know what becomes of the large quantities produced in Bedfordshire and some other of the counties. As we have frequently stated, we do not grow this esculent so largely as we should do, but this is a very different matter from depending "wholly" upon foreign supplies. With reference to cabbages, the writer states, "that the poor would be badly off indeed for this healthy vegetable if they relied only on the English growth," and "that the cabbages sold at the Borough Market, at Spitalfields, and along the wharves are in almost all cases imported from Holland." To confute these statements is wholly unnecessary. Nor, indeed, is it possible to seriously discuss such assertions as "the best vegetables of all grades are of foreign importation," the "English production is but a small item in the market," and "the greengrocers' stock is ten times as heavy as it was 20 years ago, yet for almost everything that is in it, the dealer he purchases from, looks to the Continent for his supply," in view of the fact that last year we devoted 1,652,860 acres to the cultivation of fruits and vegetables, of which the greater proportion was sent to market. But we must confess to some surprise that they should have been considered deserving of "permanent preservation."

The *Gardeners' Chronicle* for August 11th, 1894, contained the following paragraph:—

"In this article one side of the question is treated, but the writer has not availed himself of the very striking facts which were published on this subject in our columns last year, nor does he deal with the very difficult problems connected with markets and the means of distribution."

The general tendency of the professional journals, it will be seen, is to minimize the state of things to which attention was called. This is of course one way of dealing with it. Perhaps a more profitable one is to extract from the *Annual Statement of the Trade of the United Kingdom with Foreign Countries and British Possessions*, the statistical facts as to the actual importation of vegetables into this country and their value. The classification, unfortunately, is not carried into very great detail, but it brings out some striking points.

PRINCIPAL ARTICLES (Vegetables) of Foreign and Colonial Merchandise imported in 1894.

ONIONS, RAW :	Bushels.	£
From Germany - " - - -	227,175	31,758
" Holland - " - - -	1,088,610	137,799
" Belgium - " - - -	266,099	32,898
" France - " - - -	697,620	90,162
" Portugal - " - - -	283,671	53,601
" Spain - " - - -	1,189,528	196,210
" Turkey - " - - -	54,701	11,476
" Egypt - " - - -	1,400,793	197,751
" United States of America -	17,767	3,791
" other foreign countries -	7,883	1,715
Total from foreign countries -	5,233,847	757,161
From Malta - " - - -	51,239	7,393
" other British possessions -	3,426	486
Total from British possessions -	54,665	7,879
Total - " - - -	5,288,512	765,040

POTATOES :					Cwts.	£
From	Germany	-	-	-	92,427	22,623
"	Holland	-	-	-	271,141	71,560
"	Belgium	-	-	-	95,336	17,535
"	France	-	-	-	895,983	283,454
"	Portugal	-	-	-	97,521	35,133
"	Spain	-	-	-	14,934	5,123
"	Canary Islands	-	-	-	58,742	37,668
"	other foreign countries	-	-	-	14,398	4,369
Total from foreign countries					1,540,482	477,465
From	Channel Islands	-	-	-	1,139,542	540,539
"	Malta	-	-	-	23,436	12,003
"	other British possessions	-	-	-	343	84
Total from British possessions					1,163,321	552,626
Total					2,703,803	1,030,091

**VEGETABLES, RAW, Unenumerated, imported during the Years
1889-94.**

Year.					Value.	
					£	
1889	-	-	-	-	621,760	
1890	-	-	-	-	773,590	
1891	-	-	-	-	932,917	
1892	-	-	-	-	1,016,280	
1893	-	-	-	-	1,076,749	
1894	-	-	-	-	1,090,370	

The progressive increase in the case of unenumerated vegetables from 1889 to last year speaks for itself. The following table gives the source of origin for 1894:—

					Value.	
					£	
From	Denmark	-	-	-	3,242	
"	Germany	-	-	-	37,711	
"	Holland	-	-	-	99,596	
"	Belgium	-	-	-	15,644	
"	France	-	-	-	345,530	
"	Portugal	-	-	-	16,723	
"	Madeira	-	-	-	5,312	
"	Spain	-	-	-	81,324	
"	Canary Islands	-	-	-	122,795	
"	Italy	-	-	-	38,322	
"	Austrian Territories	-	-	-	18,859	
"	Roumania	-	-	-	10,062	
"	United States of America	-	-	-	45,068	
"	other foreign countries	-	-	-	4,137	
Total from foreign countries					844,325	
From	Channel Islands	-	-	-	244,369	
"	other British possessions	-	-	-	1,676	
Total from British possessions					246,045	
Total					1,090,370	

TOTAL VALUE of the Vegetables imported into the United Kingdom
during the Year 1894:—

	£
Onions - - - - -	765,040
Potatoes - - - - -	1,030,091
Raw vegetables, unenumerated - -	1,090,370
Total - - - - -	<u>2,885,501</u>

The values of the imports of fruit for the same year are also striking. The following are the principal items:—

	£
APPLES (raw) - - - - -	1,389,421
The most important sources of supply were:—	
United States of America - - - - -	438,114
Canada - - - - -	317,154
PEARS (raw) - - - - -	411,316
The most important source of supply was France	
PLUMS (raw) - - - - -	302,105
The most important source of supply was France	
	170,826

Comment upon these figures may for the moment be deferred. But the whole subject has recently engaged the attention of the Board of Agriculture which published in its *Journal* for March 1895 (pp. 287-291) a very important article which is reproduced.

MARKET GARDENING.

In 1875 there were 38,957 acres of market gardens in Great Britain, whilst in 1894 there were no fewer than 88,210 acres, exclusive of vegetable crops on farms. The farmers have of late years competed keenly with market gardeners in the cultivation of greens and cabbages, with which they can feed their stock in case of a glut in the market.

Farmers, especially those near railways in direct communication with good markets, also grow, to a considerable extent, peas for podding, broad beans, turnips and turnip-greens, and early potatoes. They have not yet cultivated, at least in any important degree, those vegetables which require a great deal of labour, such as onions, carrots, parsnips, cucumbers, French beans, radishes, &c.; with respect to these, however, the market gardeners are more or less severely interfered with by foreign supplies, which grow larger year by year.

Foreign competition has made itself felt in respect of early vegetables and salads, which are imported some weeks before those grown in England are ready for market. Early turnips, carrots, peas, and French beans from France, the Canary Islands, Madeira, and Algeria, arrive long before English market-gardeners can supply these vegetables, and when their own expensive crops are ready, the fancy prices have passed into foreigners' pockets, and as market-gardeners say, "the edge of the appetite for this early produce has been taken off." The same applies to salads, notably to lettuces, which are imported in large quantities from France and the Canary Islands as early as January, months before English market-gardeners can send them into market. This importation continues until June, when the demand for young crisp lettuces has been satisfied. A few years ago cucumbers yielded considerable profits to home-growers, but now they are imported so

early and so largely from Holland, and are usually so plentiful and cheap, that many market-gardeners in Great Britain have ceased to grow them. Radishes, another very profitable crop in past years, are sent in quantities from February to April from Paris, St. Malo, and the Channel Islands, completely forestalling English produce. Very large importations are made from Holland of beetroot and red cabbage for pickling, which, until recently, were profitably cultivated in England.

But it is in the case of onions that there has latterly been the most extraordinary increase in importation. Onions were regarded as an almost safe-paying crop if the weather were favourable, but in the last two years prices have been so forced down by foreign competition, that in many years, especially in 1894, the growers have lost heavily. In some instances it was impossible to dispose of onions in the last season.

In 1875, 1,695,456 bushels of onions, valued at 321,316*l.*, were imported into Great Britain, mainly from Holland, Belgium, France, and Portugal—Holland being by far the largest exporting country. The amount of this importation in 1884 was 3,474,746 bushels, valued at 481,427*l.*, from Germany, Holland (which sent 1,481,543 bushels), Belgium, France, Portugal, Spain, Italy, and Egypt. In 1894 no less than 5,288,512 bushels of onions, of the value of 765,040*l.*, came from abroad.

It is noteworthy that the imports of onions from Holland have considerably decreased since 1885, but those from Germany, France, and Spain have much increased. The receipts of onions from Egypt have more than quadrupled in the past decade.

Potatoes, again, were formerly important sources of profit to British market-gardeners. Early and quick-growing varieties were put in and dug early to supply the demand for new potatoes, and other crops were got in and taken off during the autumn. Importations of very early potatoes from Algeria, France, Lisbon, Malta, Teneriffe, and Holland interfere much with English growers of potatoes, and threaten to interfere with potato-growers in the Channel Islands, whose potatoes are not ready in any quantity until the first week in May. The arrivals of new potatoes commence about Christmas time, and continue in increasing quantities until the Channel Islands season begins. The average importation of potatoes for the first six months of the last three years from France, Lisbon, Canary Islands, Malta, the Channel Islands, and other countries was 1,764,258 cwts., of an average value of 710,586*l.*

The importation of potatoes from the Channel Islands begins in May and continues until August. The average quantity of potatoes imported from this source for the four months—May, June, July, August—of the last three years was 1,171,216 cwts., of an average value of 521,141*l.* for each of the three periods.

The average annual importation of potatoes of the last three years from all parts of the world to this country amounted to 2,846,754 cwts., of an average value of 962,458*l.*

The volume of imported potatoes has, however, decreased considerably during the past quarter of a century, and the character of the trade has changed in a great and significant degree. For the three years ending 1875, the average annual importation of potatoes was 5,363,136 cwts. For the three years ending 1885, the annual average importation was 3,297,867 cwt. Since 1880, some of the large importing countries which formerly sent potatoes in the late summer and autumn have greatly diminished their supplies, as they could not compete with the English

main crop produce. But from the Canary Islands, the Azores, Malta, Spain, and the south of France, and other sources, steady supplies of new potatoes have been sent.

Besides the new potatoes and onions imported, large quantities of raw, unenumerated vegetables, such as peas, French beans, lettuce, and other "salads," cauliflowers, spinach, beetroot, radishes, turnips, and cucumbers are sent from Denmark, Germany, Holland, France, Portugal, Madeira, Spain, Canary Isles, Italy, Austrian Territories, Roumania, United States, and other countries. The average annual value of these imported vegetables during the past three years was 1,027,411*l.* In 1885 the value of these raw vegetables was 467,287*l.*, while in 1875 it was only 132,124*l.*, divided mainly between Holland, France, and Germany.

This importation of raw vegetables is spread fairly evenly over each month in the year, though it is somewhat larger in June, July, and August. It interferes materially with the prices of *primeurs* in the early spring months, and it is from *primeurs* and delicate vegetables and salads that market-gardeners have hitherto made their chief gains. Some profit is still made from young "bunching" onions in May and June, as onions are not imported in this form. These are now, however, produced by farmers who, as a market-gardener remarked lately, 'are driven into it, and look over the hedge, and try to imitate their neighbours.' Until a few years ago, celery was a very paying crop, realising gross returns of 40*l.* to 70*l.* per acre, when it was grown by comparatively few *bonâ fide* market-gardeners. Now it is grown by farmers, and upon sewage farms, so that prices have fallen, and in some seasons the markets are over-supplied. Large quantities of celery are now grown in Yorkshire and Lincolnshire. In some districts, asparagus was formerly produced with considerable profit to the growers, especially for the first fortnight or so of the season, but the importation of asparagus from Toulouse, Dijon, Paris, and parts of Spain, which begins in January and continues until about the time when English asparagus is ready, has in recent years rendered this crop less profitable.

The high rents of market-garden land near London, in Middlesex, Essex, Kent, and Surrey, as well as the dearth and scarcity of labour, also handicap the industry. This applies to all market-gardens near large centres of population where the labourers can get good wages in various other employments. Near London and other cities, women, whose labour is most useful in some of the processes of cultivation and after-management of vegetables, are becoming more and more disinclined to work on the land. In the production of such crops as onions, carrots, celery, and lettuce, a great deal of labour is absolutely essential, not only for their cultivation, but also for preparing them for market, and in this respect farmers in many localities would have a considerable advantage. Market-gardeners in the vicinity of London and other populous places are able to cart their vegetables to market in their own conveyances. Farmers who live near railways communicating directly with markets, are able to consign large quantities of vegetables at fairly reasonable rates, though they and market-gardeners complain of the rates charged for small consignments of their produce.

Technical knowledge is necessary in the production of vegetables. Some market-gardeners are particularly clever, energetic, and hardworking, always on the look-out for some new "idea," and many of them, from their connexion with salesmen and their propinquity to towns are in close touch with the vegetable markets, and are well and regularly posted up as to supply and demand. In these respects they have a certain advantage over farmers, who do not, as a rule, care about small

details, and would not have such opportunities of getting information as to immediate and prospective market wants. But where technical knowledge may be easily obtained, as well as reliable and continuous information concerning the state of markets, and it will pay to grow vegetables, farmers will no doubt adapt themselves to circumstances rendered necessary by the exigencies of the times.

There appears to be some opening for the further cultivation of tomatoes under glass. It would seem to be generally admitted that the climate of this country is too uncertain to permit of their successful cultivation in the open. A large and increasing business is carried on in the Channel Islands in growing tomatoes, in cheaply-built glass-houses, for the English markets. The cultivation of this vegetable is simple and profitable, and in view of the increasing demand, it may be worthy of the attention of British farmers.

Market-gardeners have done best who grow fruit and vegetables together, in localities distant from London, and near railways communicating readily with Manchester and Birmingham as well as the metropolis. Flowers and tomatoes are also grown occasionally, as well as herbs and salads, so that there is almost always something to send to market. In some of these favoured districts, as Pershore and Evesham, for example, there has been a large increase in the acreage of market-garden land, and the demand for, and the price of suitable land have increased. But even here there has been a marked falling-off in the profits in the past two years, and the cultivators are somewhat discouraged, and are re-arranging their rotations to suit the altered conditions.

It was pointed out in the *Kew Bulletin* (1894, p. 219) that there are two problems involved in the question. Early vegetables and those which require abundance of summer sunshine to mature them may be grown in warm climates in the open air, but can in this country only be produced under glass. "Early vegetables are a luxury for the rich. They can always be produced in lower latitudes for consumption in higher. The enhanced cost principally represents the difficulty and distance of transport for perishable commodities." The competition is between the cost of transit on the one hand and the interest on the capital invested on the other, supposing that in other respects the cost of production to be about equal. But the cost of foreign transport is continually being reduced, and in the long run the foreign article is likely to out the home-grown.

Where, however, the competition is with contiguous countries in the North of Europe, the explanation of the large and increasing amount of foreign imports is not so obvious. It is noteworthy that according to the Board of Agriculture, "the importation of raw vegetables is spread fairly evenly over each month of the year, though it is somewhat larger in June, July, and August." Here it is not wholly a question of earliness. It is interesting to analyse the causes assigned by the Board of Agriculture:—

- i. High rents.
- ii. Disinclination of women to work on the land.
- iii. Excessive railway rates for small consignments.
- iv. Want of technical knowledge.

It is clear that with regard to i., iii., and iv., they are susceptible of self-adjustment. Rents may come down; technical knowledge will increase; and already railway companies are showing a disposition

to facilitate the distribution to the consumer of vegetable produce. ii. points to another and less obvious cause, which at first sight seems paradoxical—the increasing prosperity of the country and the rise in the “standard of comfort.” To put the point in an extreme form: a nation might say that it would rather buy an article of consumption from outside than produce it itself; and it is by no means impossible that this approaches the secret of the whole matter. If the price of labour allows of cabbages being grown more cheaply in Holland than in England, they will be imported.

The Board of Agriculture pointed out in its Journal for December 1894 (b. 150) another cause:—

v. The fewness of distributing centres.

“So long as the practice continues of consigning the chief part of the fruit grown in this country to the few existing markets there must be occasional glut.” Yet, however abundant the harvest of fruit, the price to the local consumer rarely falls. What is mainly wanted then is greater facilities of distribution as between the producer and the consumer.

The following interesting illustration is taken from the *Daily Telegraph* for July 17, 1894:—

“A correspondent says: A salesman in Covent Garden had consigned to him last Saturday 2,500 bags of peas, representing 30,000 pecks. A large quantity of these were sold as low as 1s. per bag, or 1d. per peck. The cost of gathering is about 1s., carriage 6d., commission and other charges 6d., total 2s. each bag. The coster would gain a heap of money by the glut, the public an advantage, the salesman his commission, and lastly the producer, whose share has wholly disappeared, may find himself called upon to make good any loss incurred by the transaction.”

With regard to potatoes it is interesting to observe that the importation is gradually declining. According to the *Agricultural Returns for Great Britain*, 1894, published by the Board of Agriculture (p. xxxix.), the figures for the last twenty years stand as follows:—

		Tons.
1873	- - - - -	375,300
1883	- - - - -	257,500
1893	- - - - -	141,000

For the last year the gross production in the United Kingdom was 6,541,000 tons (p. xxvi.). One potato therefore in something under fifty would be foreign. But as the bulk of the imports of potatoes are from France and the Channel Islands, it is obvious it is pretty nearly accounted for by the earlier crop which those countries produce.

The case of onions is, however, the most enigmatical. The *Gardeners' Magazine* asks, “What becomes of the large crops grown in Bedfordshire?” and the Board of Agriculture replies, “in some instances, it was impossible to dispose of onions in the last season.”

The pages of the *Gardeners' Chronicle*, which is the leading professional journal, have been searched for “striking facts” which would throw light on the problems involved, without much success.

In the number of February 4, 1893 (page 136) it states that “much of the success attending the importation of American apples is due to colour in the fruit.” It recommends “making a better selection of varieties of apples as well as improved methods of culture and of packing” and further that in schools “children should be taught that it is a patriotic thing to consume a home grown apple.”

The same number gives (page 137) a striking statement as to the contrast between home and foreign freights.

“As an illustration of the excessive charges which agriculture in this country has to submit to, it may be mentioned that it costs less to bring agricultural seeds from Chicago to London, a distance of about 4,000 miles (of which 1,000 are by rail and 3,000 by steamer) than it does from stations within 150 miles of London. In Europe also, the difference though less is still excessive, the carriage from the North of France to London being less than from the home counties, and from the South of France than from Yorkshire.”

CCCCXCII.—DECADES KEWENSES.

PLANTARUM NOVARUM IN HERBARIO HORTI REGII CONSERVATARUM.

DECAS XXII.

The plants of this decade are from a collection made by Dr. Leo Hirsch, in the summer of 1893, in the country of Hadramaut, in Southern Arabia. They were placed at our disposal for publication by Dr. Schweinfurth, with the special idea of their being compared with the collections made in the same region by J. Theodore Bent, Esq., and Mr. Lunt, which are reported upon in the *Bulletin* for 1894, pp. 328–343, and 1895, p. 158 and pp. 180–186. Dr. Hirsch landed at Makalla, ascended the mountains of the interior to a height of over 6000 feet, and returned to the same port. A short account of his expedition will be found in Petermann's *Mittheilungen*, 1894, p. 30. The collection contained about 150 species, of which only three were amongst the novelties discovered by Messrs. Bent and Lunt.

211. *Dombeya arabica*, Baker [Sterculiaceæ]; fruticosa, ramulis dense stellato-pubescentibus, foliis breviter peliolatis cordato-orbicularibus obtusis sinuatis irregulariter dentatis prope marginem crispatis facie tenuiter dorso dense stellato-pubescentibus venis elevatis, cymis pluribus in paniculam brevem coarctatis ramis dense pubescentibus, bracteis ovatis pilosis, pedicellis flore longioribus, sepalis ovatis dense pubescentibus, petalis obovatis coccineis calyce paulo longioribus, staminibus 15 tubo filamentarum brevissimo staminodiis lanceolatis petaloideis coccineis, stylo obsoleto.

Habitat.—Hadramaut, Southern Arabia, Hirsch, 170.

Folia 3–4 poll. longa et lata. *Calyx* 3 lin. longus. *Petala* 4 lin. longa.

Very distinct in its very short staminal tube, staminodia just like the petals in colour and texture, and obsolete style.

212. *Thamnosma Hirschii*, Schuf. [Rutaceæ]; herbacea, perennis, glabra, in partibus omnibus glandulis subimmersis copiosis rutaceis flavo-viridibus prædita, foliis remotis sessilibus linearibus marginibus revolutis, floribus laxè racemosis, pedicellis erecto-patentibus, calycis lobis ovatis obtusis, petalis oblongis calyce 3–4-plo longioribus, stami-

nibus petalis æquilongis filamentis linearibus antheris parvis globosis, fructu coriaceo oblongo profunde bifido lobis apice rotundatis, seminibus globosis granulatis.

Habitat.—Kischin, Hadramaut, Southern Arabia, *Hirsch*, 77. Native name *bdalit*.

Folia 4–9 lin. longa. *Petala* 1 lin. longa. *Fructus* 3 lin. longus.

The two original species came from Texas and California. Dr. Balfour found a third in Socotra; and we have a fourth from the Transvaal, as yet undescribed, collected by Dr. Atherstone. The Arabian plant most resembles *T. texana*, Torrey.

213. *Rhamnus leucodermis*, *Baker* [Rhamnaceæ]; fruticosa, glabra, ramulis albis teretibus spinis pungentibus patulis cylindricis rectis basi dilatatis ad nodos præditis, foliis fasciculatis obovati-oblongis obtusis breviter petiolatis rigide coriaceis utrinque viridibus, floribus solitariis pedunculatis, calycis campanulati lobis ovatis, petalis angustis viridibus calyce paulo longioribus, ovario globoso, stylo ovario æquilongo, fructu globoso cuspidato.

Habitat.—Hadramaut, Southern Arabia, *Hirsch*, 84.

Folia 4–6 lin. longa. *Sepala* $\frac{1}{2}$ lin. longa. *Fructus* 2 lin. longus.

Near *R. oleoides*, Linn. and *R. græca*, Boiss.

214. *Rhus flexicaulis*, *Baker* [Anacardiaceæ]; fruticosa, ramulis gracillimis teretibus dense pilosis, foliis petiolatis digitatim trifoliolatis foliolis oblanceolato-oblongis obtusis integris basi cuneatis utrinque sordide viridibus dense pilosis, floribus perminutis in paniculam amplam laxam terminalem ramis pubescentibus flexuosis dispositis, pedicellis erecto-patentibus flore longioribus, bracteis ovatis acutis parvis persistentibus, sepalis late ovatis, petalis oblongis obtusis viridibus calyce 2–3 plo longioribus, staminibus petalis brevioribus.

Habitat.—Hadramaut, Southern Arabia, *Hirsch*, 153.

Petiole 3–4 lin. longi. *Foliola* 6–8 lin. longa. *Petala* $\frac{1}{2}$ lin. longa. *Fructus* ignotus.

Near the Indian *R. mysorensis*, Heyne, and *R. parviflora*, Roxb.

215. *Tephrosia* (*Reineria*) *geminiflora*, *Baker* [Leguminosæ]; herbacea, perennis, caulibus gracillimis adpresse albo-sericeis, stipulis subulatis persistentibus, foliis petiolatis pinnatim trifoliolatis foliolis linearibus rigide coriaceis utrinque adpresse albo-sericeis terminali breviter petiolulato lateralibus majore, floribus geminis axillaribus, pedicellis calyce brevioribus, calycis tubo campanulato sericeo dentibus cuspidatis basi deltoideis tubo longioribus, petalis pallide rubellis calyce duplo longioribus, vexillo obovato extus sericeo, alis angustis vexillo distincte brevioribus, genitalibus petalis brevioribus, ovario lineari multiovulato.

Habitat.—Hadramaut, Southern Arabia, *Hirsch*, 94.

Foliolum terminale 12–15 lin. longum, 1 lin. latum. *Calyx* $1\frac{1}{2}$ lin. longus. *Vexillum* 3 lin. longum. *Fructus* ignotus.

Near *T. subtriflora*, Hochst.

216. *Conyza stenodonta*, *Baker* [Compositæ-Asteroidæ]; suffruticosa, ramulis lignosis brunneis obscure pubescentibus, foliis crebris sessilibus oblanceolatis acutis pinnatifidis segmentis paucis remotis

linearibus margine leviter recurvatis, capitulis multis laxe corymboso-paniculatis, pedunculis brevibus vel elongatis, involucri campanulati bracteis multiseriatis rigidis pallidis adpressis, interioribus linearibus exterioribus sensim brevioribus, achæniis cylindricis, pappo albo flexili corollæ tubo æquilongo.

Habitat.—Hadramaut, Southern Arabia, *Hirsch*, 55. Native name, *hatêke*.

Folia 12–15 lin. longa, segmentis 1 lin. latis. *Involucrum* 2–2½ lin. longum. *Pappus* 1½ lin. longus.

Near *C. stricta*, Willd.

217. *Conyza cylindrica*, *Baker* [Compositæ-Asteroideæ]; suffruticosa, tenuiter albo-incana, ramulis lignosis teretibus pallidis, foliis sessilibus simplicibus crassis subcylindricis facie canaliculatis, capitulis paucis laxe corymbosis longe pedunculatis, involucri campanulati bracteis multiseriatis adpressis rigidis pallidis interioribus linearibus exterioribus sensim brevioribus, achæniis pubescentibus, pappo setoso albo flexili corollæ tubo æquilongo.

Habitat.—Ras Schirwén, Hadramaut, Southern Arabia, *Hirsch*, 80. Native name, *Tabefet*.

Folia ½–1½ poll. longa, ½ lin. diam. *Involucrum* 2 lin. longum. *Pappus* 1½ lin. longus.

218. *Grantia senecionoides*, *Baker* [Compositæ - Inuloideæ]; herbacea, perennis, caulibus pilis mollibus brevibus patulis dense vestitis, foliis alternis petiolatis lyrato-oblongis bipinnatifidis lobo centrali oblanceolato lateralibus paucis remotis superioribus pinnatifidis segmentis linearibus inferioribus sensim minoribus, capitulis multifloris discoideis ad apices ramulorum solitariis involucri campanulati bracteis biseriatis exterioribus foliaceis integris linearibus interioribus brevioribus lanceolatis scariosis pallidis pubescentibus, achæniis pubescentibus, pappo biseriali exteriore brevi paleaceo interiore setoso albido corollæ tubo æquilongo.

Habitat.—Hadramaut, Southern Arabia, *Hirsch*, 14.

Folia inferiora (cum petiolo) 3–4 poll. longa, segmentis 1 lin. latis. *Involucrum* 6 lin. longum. *Pappus* 3 lin. longus.

Resembles *G. discoidea*, Bunge, in the capitula and involucre. Differs by its bipinnatifid leaves.

219. *Hirschia*, *Baker* [Compositarum-Inuloidearum genus novum]. *Capitula* homogama, multiflora, discoidea, floribus omnibus hermaphroditis. *Involucrum* duplex, bracteis exterioribus foliaceis profunde pinnatifidis, interioribus 2–3-seriatis chartaceis lanceolatis æquilongis. *Receptaculum* convexum. *Corolla* subcylindrica, lobis 5 æqualibus erectis ovatis cuspidatis. *Antheræ* basi caudatæ. *Stylus* plane evolutus ignotus. *Pappus* setosus, setis fragilibus valde inæqualibus, exterioribus brevioribus. *Herba* perennis, ramulis albo-incanis, foliis alternis petiolatis bipinnatifidis segmentis angustis, capitulis ad apices ramorum solitariis.

H. anthemidifolia, *Baker*. The only species.

Habitat. Hadramaut, Southern Arabia, *Hirsch*, 35.

Folia cum petiolo 1–1½ poll. longa, segmentis ½ lin. latis. *Involucrum* 7–8 lin. longum. *Pappus* 3 lin. longus.

This new genus comes nearest to *Grantia*, from which it differs by its homogamous discoid flowers, biseriate involucre with pinnatifid foliaceous outer bracts, and the absence of a paleaceous outer row to the pappus. In general habit it most resembles the Algerine *Grantia* (*Perralderia*) *coronopifolia*, Benth. et Hook. fil.

220. *Caralluma arabica*, N. E. Brown [Asclepiadeæ]; *C. tuberculata* similis, floribus terminalibus umbellatis pedicellatis omnino glabris, sepalis ovatis acutis, corollæ tubo brevi campanulato lobis ovatis acutis levibus atro-purpureis, coronæ exterioris lobis profunde bifidis segmentis linearifiliformibus obtusis erectis apice arcuatis quam columna staminum multo longioribus, coronæ interioris lobis linearibus obtusis dorso gibbosis super antheras incumbentibus et eis subæquantibus.

Habitat.—Southern Arabia: Wadi Raida, near Saihut, *Hirsch*, 28.

Pedicelli $1\frac{1}{2}$ –2 lin. longi. *Sepala* $\frac{1}{2}$ – $\frac{2}{3}$ lin. longa. *Corollæ tubus* $1\frac{1}{3}$ lin. longus, lobi 2 lin. longi, $1\frac{1}{2}$ lin. lati. *Coronæ exterioris* lobi $\frac{3}{4}$ lin. longi, segmentis $\frac{1}{2}$ lin. longis; interioris lobi $\frac{1}{4}$ – $\frac{1}{3}$ lin. longi.

CCCCXCIII.—MISCELLANEOUS NOTES.

Mr. FREDERICK ENOS WILLEY, in the employ of the Royal Gardens, has been appointed by the Secretary of State for the Colonies Curator of the newly founded Botanic Station at Sierra Leone. Mr. Willey entered the Royal Gardens in June 1892. He was lent from Kew to act as Curator of the Botanic Station at Aburi, Gold Coast, during the absence, in 1893–4, of the late Mr. Crowther, who was sent by his Government to inspect the principal Botanic Gardens in the West Indies. Mr. Willey managed the station to the satisfaction of the Government of the Gold Coast and is therefore prepared by previous experience in West Africa for the duties of his new post.

Mr. J. M. HENRY has retired from the post of Superintendent of the Baroda State Gardens after 16 years service. He was sent out from Kew in 1867, and after 12 years service in Madras and Bengal was appointed to Baroda in November 1879.

Botanical Magazine.—The number for November is essentially an orchid number, the only other plant figured being the showy verbenaceous *Amasonia erecta*, a native of eastern tropical South America, for living plants of which Kew is indebted to Messrs. Sander & Co. The orchids are: *Angræcum Kotschyi*, from a very fine raceme from the garden of Sir Trevor Lawrence; *Spathoglottis kimballiana*, a pretty Bornean species, also one of Messrs. Sander's introductions; *Catasetum Lemosii*, native of the Ile de Marajo, at the mouth of the Amazons, sent to Kew by Mr. E. Rand in 1894; and *Selenipedium sargentianum*, a native of Brazil, imported by Messrs. Sander, and flowered in 1895. With the exception of the *Catasetum*, these are all handsome ornamental orchids.

Hooker's Icones Plantarum.—Part one of Vol. V. of the fourth series (plates 2401–2425) opens with some new *Dipterocarpeæ*, including the handsome, though almost worthless, *Dipterocarpus Bourdillonii*, “an enormous tree 150 feet high, with a straight trunk 5 feet in diameter,” inhabiting North Travancore. *Ramisia brasiliensis* is a somewhat anomalous member of the *Nyctagineæ*, clothed with stellate scales like an *Elæagnus*, and having an accrescent perianth $1\frac{1}{2}$ inches in diameter, enclosing the ripe fruit. *Lysimachia grandifolia*, a native of China, is remarkable for its ample foliage and umbellate flowers; and *Petrocosmea grandiflora*, from the same country, is a beautiful species with cobalt blue flowers three times as large as those of the previously known species. *Daniella thurifera* is the frankincense tree of Sierra Leone. *Comoroa pisocarpa* is a new genus of the *Aurantiaceæ*, having unifoliate leaves and minute flowers. *Melastomaceæ* are represented by a number of curious novelties from Borneo, including a new genus, *Hederella*, allied to *Medinilla*. *Aloc minima* is a diminutive species discovered by M. S. Evans in Natal. Finally there are figures of two elegant species of the Mexican umbelliferous genus *Neogoezia*, described in the *Bulletin*, 1894, p. 354. Unfortunately several misprints and other errors were overlooked in this number. Thus in the letterpress to plate 2415, p. 3, the name *Malanthos* and its derivation should be cancelled. *Hederella quintuplinervis*, Stapf, plate 2416, is not a new species, but the same as *Dissochaeta quintuplinervis*, Cogn. *Pomatostoma sertuliferum*, plate 2420, is also not new, as may be seen from the synonymy.

Distribution of Kew Seeds.—The publication annually of a list of seeds ripened at Kew and available for exchange has resulted in a considerable increase in the number of packets of seeds distributed. They are applied for from both public and private gardens in all parts of the world. The seeds are for the most part of select plants. Last year (1894) nearly 6000 packets were supplied to correspondents whose desiderata had been selected from the printed list. In addition to this number nearly 1000 packets of seeds received from Botanic Gardens in India and the Colonies were distributed from Kew. The total number of packets of seeds distributed annually from Kew previous to the issue of a printed list in 1885 was about 2000 per annum.

Removal of large Screw Pines.—The disappearance from the north wing of the Palm house of the two large specimens of Screw Pines (*Pandanus*) which had for so many years been conspicuous objects in it requires a brief record. The age of both was probably not less than 70–80 years. They were, therefore, in existence at Kew before it became a national establishment. The names which they have always borne are perhaps not free from doubt. But the accurate determination of *Pandanads* is attended with extreme difficulty.

Pandanus reflexus.—This was a striking plant of great size which stood at the end of the wing near the staircase. It immediately attracted attention from its dense heads of enormous stiff sword-shaped leaves. According to John Smith's *Records of Kew* (p. 126) it was introduced to Kew by Wallich in 1818. *P. reflexus* is an obscure

species said to be a native of Bourbon. Whether the Kew plant was correctly referred to it will perhaps never be known with certainty. It was a male plant and the correct determination of plants of this sex presents great difficulties.

In July 1889 a large plant of *Pandanus odoratissimus* was received from the Oxford Botanic Garden and planted in the Palm house immediately opposite the *Pandanus reflexus*. It died in the following November apparently from the same disease as eventually also killed the larger plant. In 1891 it was noticed that the foliage of this had a somewhat yellowish and unhealthy appearance. The great heads of leaves began one by one to fall over, evidently from a rotting of the stem at the "neck." They were removed but the mischief continued and eventually it became necessary to sacrifice the whole plant.

The loss from disease of a large and important specimen in a Botanic Garden where it is constantly under observation is a comparatively rare event. In the case of Pandanads several cases however are recorded, the details of which agree in all essential particulars. In 1870 a plant of *P. odoratissimus* with a stem 10 feet high perished in this way in the Breslau Botanic Garden. It was made the subject of an elaborate investigation by Dr. J. Schroeter in Cohn's "*Beitrage zur Biologie der Pflanzen*" (i., pp. 87-107). He gave the disease the very appropriate name of "Die Stamm fäule der Pandaneen." His careful description of the progress of the disease exactly agrees with what was observed at Kew:—"The leaves were healthy except at the base where they were soft and discoloured. The part of the stem exposed by their falling, about 8 inches in length, was yellow-grey in colour; below this diseased band there were spots similarly affected. Above the band the stem appeared to be healthy. The disease extended downwards and inwards. All the branches ultimately became affected."

Curiously enough in the same year a fine screw pine (*Pandanus utilis*) at the Botanic Garden, Glasnevin, succumbed in the same way. The director, Dr. Moore, gave an account of it to the Royal Dublin Society on March 20, 1871. "It was upwards of 50 years old, and had attained to a height of 25 feet from the ground to its uppermost branches, having a clean stem for nearly 10 feet." The account which Dr. Moore gives of the progressive destruction of the Dublin plant accords exactly with our experience at Kew.

Material from the Kew plant was sent for examination to Professor Marshall Ward, F.R.S. He reported "There is no doubt whatever as to the main point. I have got into the heart of the stem, and find a perfectly distinct, though very slender, mycelium ramifying in the cell-walls; as yet I do not see it in the leaves. It is a most murderous 'beast' evidently."

Dr. Schroeter found what can hardly be doubted to have been the same fungus in the Breslau case. He identified it with *Melanconium Pandani* which Lévêillé found attacking a *Pandanus* at Paris in 1845.

Melanconium is, however, only a phase in the life-history of some sphaeriaceous fungus. Other phases no doubt exist in a less conspicuous form, and it is from these that the screw pines become infected. It is noticeable that in all the recorded cases the plants have attained considerable dimensions before they are attacked.

Pandanus odoratissimus.—There is no record of the original introduction of the striking plant which, under this name, occupied a conspicuous position at the extreme end of the north wing. But it was probably of about the same age as the *P. reflexus*. Unfortunately

screw pines grow only from the extremities of their branches, and do not when cut in produce new growths by the development of adventitious buds. No ordinary horticultural building can therefore eventually accommodate them, and their removal on account of unmanageable size is only a question of time. Before its removal the great Kew Screw Pine "had about 40 branches, each bearing a huge tuft of foliage, and it measured 30 feet in height, with a diameter of 40 feet. Its weight would be about 6 tons."

It was a female plant and first fruited in 1883 and produced its large heads of fruits about a foot long almost every subsequent year. It was removed in 1894 and was then bearing five heads. Up to 1882 it was grown in a tub, and there is a good figure of it in that stage in the supplement to the *Gardeners' Chronicle* for August 5, 1876. In that year it was lowered into a brick pit prepared for the purpose and so gained an additional space in height of 5 feet. The base of the stem with the striking mass of aerial roots has been carefully preserved for future exhibition in No. III. Museum. An illustration of the striking mass was published in the *Gardeners' Chronicle* for January 5, 1895. *P. odoratissimus*, Roxb., is reduced in the Flora of British India to *P. fascicularis*, Lam.

Citrus inodora.—This is a new species of *Citrus*, native of Queensland. It is of interest as possessing economic qualities rendering it suitable for cultivation as a substitute for the West India lime or for affording an Australian stock on which to graft or bud other sorts of *Citrus* plants. The following account is taken from the *Transactions of the Queensland Acclimatisation Society* (July–September, 1894, p. 194):—

Citrus inodora.—The Council were indebted to Mr. F. M. Bailey, F.L.S., Colonial Botanist, for quantity of seeds and scions of this Queensland lime. Mr. Bailey, in his *Third Supplement to the Synopsis of the Queensland Flora* (1890, page 12), describes the plant, whose habitat is on Harvey's Creek, Russell River. He adds: "This new species of *Citrus* is well worthy of cultivation for its fruit, which is juicy, and equal in flavour to the West Indian lime. In general appearance the tree resembles the orange, having the same dark-green foliage. I have chosen the specific name on account of all the flowers gathered being wanting in fragrance—a remarkable feature in a genus so noted for scented flowers." From the fruits sent by Mr. Bailey to the Society a large number of seeds were got; these had all been sown under favourable conditions, while the scions have been grafted upon *Citrus* roots. Mr. Bailey is of opinion that this *Citrus* plant will be an excellent stock on which to work any of the other sorts; it being a native, and, so far as is known, not liable to any disease, is greatly in its favour for stock purposes.

Sarda Melon.—A description of this melon was published in the *Kew Bulletin* for 1894, p. 75, ripe fruits having been received at Kew from Dr. Aitchison, F.R.S., C.I.E., who obtained them from Kabul. The seeds from these fruits were distributed to several Colonial Botanic Gardens, and to the principal private gardens in this country, including Her Majesty's Royal Gardens, Frogmore, Windsor, from whence a fruit was sent to Kew by Mr. O. Thomas, who wrote: "I send you a small fruit of the Sarda Melon for you to taste. The

flavour, I think, sweet, and very refreshing. I shall certainly grow this melon again, and use it to cross with other varieties." The fruit was 10 in. long and 7 in. in diameter; the skin yellowish-green and netted, the wall of flesh 2 in. thick, and rich in flavour as well as sweet and juicy. Dr. Aitchison pointed out in a note published in the *Kew Bulletin* that the Sarda Melon does not develop its full flavour until it has been exposed to a low temperature, and then kept for a time.

Icerya ægyptiaca in India.—In the *Kew Bulletin* for May 1890 (pp. 94–97) Mr. J. W. Douglas gave an account of a new "Mealy Bug" or coccid from Alexandria, under the name of *Crossotosoma ægyptiacum*, which Mr. Riley, the United States entomologist, subsequently identified as an *Icerya* (*Kew Bulletin*, 1891, p. 48). What Mr. Douglas believes to be the same insect has been recently found on a plant of *Aristolochia saccata* on its arrival at Kew from the Royal Botanic Garden, Calcutta, where it would, therefore, appear to be established.

Errata.—Page 94, 9th line from bottom, *for* "longpipes" *read* "longipes."

Page 124, 24th line from top, *for* "Inconum" *read* "Iconum."

Page 193, 3rd line, *for* "Batemanii" *read* "Batemannia."

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